

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Group Art Unit:

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Robert Leyendecker, Wayne Eatherly,
and Rod L. Proctor**

Application No.

Filed:

For: **IMPROVED IN-BAND SIGNALING FOR
DATA COMMUNICATIONS OVER DIGITAL
WIRELESS TELECOMMUNICATIONS NETWORKS**

Date: March 6, 2002

PRELIMINARY AMENDMENT

TO THE COMMISSIONER FOR PATENTS:

Please amend the above-identified patent application prior to examination, as follows:

In the Specification:

Replace the first paragraph of the specification (page 1, lines 14-16) with the following paragraph:

--This application is a divisional of U.S. Application No. 09/531,367 filed March 21, 2000, which is a CIP of U.S. Application No. 09/230,079, filed May 13, 1999, now U.S. Pat. No. 6,144,336, issued November 7, 2000, which is the U.S. national phase application corresponding to International Application No. PCT/US98/10317, filed May 19, 1998, and claiming priority from U.S. Provisional Patent Application Nos. 60/047,034 filed on May 19, 1997; 60/047,140 filed on May 20, 1997; 60/048,369 filed on June 3, 1997; 60/048,385 filed on June 3, 1997; and 60/055,497 filed on August 12, 1997.--

At page 4, line 30, change "ISB" to --IBS--.
At page 5, line 9, change "ISB" to --IBS--.
At page 7, line, 3, change "ISB" to --IBS--.
At page 5, line 30, change "26" to --54--.
At page 6, line 26, change "and" to --are--.
At page 6, line 20, change "16" to --18--.
At page 6, line 21, change "18" to --16--.
At page 6, line 24, change "18" to --16--.
At page 6, line 25, change "16" to --18--.
At page 6, line 27, change "16" to --18--.
At page 7, line 1, change "18" to --16--.
At page 7, line 6, change "A/D converter 18" to --A/D converter 16--.
At page 7, line 6, change "vocoder 16" to --vocoder 18--.
At page 8, line 28, change "16" to --18--.
At page 9, line 10, change "16" to --18--.
At page 10, line 23, change "modems 14" to --modem 28--.
At page 13, line 30, change "89" to --98--.
At page 15, line 6, insert --be-- after "can".

In the Drawings:

Replace drawing Figures 7 and 9 with the enclosed amended figures.

In the Claims:

Cancel claims 1 to 19 and 31 to 41.

REMARKS

The present application is a divisional of U.S. Patent Application No. 09/531,367 filed March 21, 2000.

1. Amendments to the Specification.

The specification is amended to comply with revised Rule 1.78. 37 CFR 1.78 (2000). Minor corrections are made to the specification, *passim*, as suggested by the

Examiner in the parent case (except at page 6, lines 28 and 29, where the original is correct) and to correct references to "A/D converter 16" and "vocoder 18."

2. Corrections to the Drawings.

The Examiner in the parent case objected to reference character 100 in Figure 9 because it was used to designate both "Packet Disassembler" and "Packet Assembler." Reference character 100 refers to "Packet Disassembler." The reference to "Packet Assembler" is deleted.

In Figure 7, reference numbers 16 and 18 are interchanged for consistency with the other drawing figures, and corresponding changes are made to the specification.

Revised drawing Figures 7 and 9 are submitted herewith, along with redlined copies of the original drawings indicating the changes.

3. Claims.

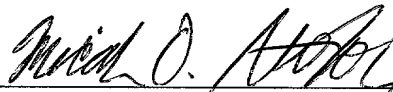
Claims 1 to 19 and 31 to 41 are canceled.

Claims 20 to 30 are presented for examination.

Respectfully submitted,

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By



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Complete Set of Pending Claims

20. A cellular telephone, comprising:
an audio microphone for converting voice signals into electrical voice signals;
an analog to digital converter for converting the electrical voice signals into digital voice samples;
a voice coder for converting the digital voice samples into encoded digital voice signals;

a transceiver that transmits the encoded digital voice signals over a digital voice channel of a wireless communications network; and

an inband signaling modem that converts a digital bit stream into synthesized tones and outputs the synthesized tones to the voice coder, the voice coder encoding the synthesized tone in the same manner as the electrical voice signals before being transmitted over the digital voice channel.

21. A cellular telephone according to claim 20 including a digital to analog converter coupled between the inband signaling modem and the analog to digital converter.

22. A cellular telephone according to claim 21 wherein the inband signaling modem and the digital to analog converter are located in a device detachably coupled to the cellular telephone.

23. A cellular telephone according to claim 20 including a packet formatter that converts the digital bit stream into inband signaling packets that include sacrifice bits that can be corrupted without losing any of the content of the digital bit stream.

24. A cellular telephone according to claim 23 wherein the sacrifice bits are located at the beginning and at the end of the inband signaling packets.

25. A cellular telephone according to claim 23 wherein the packet formatter attaches a sequence of preconditioning bits to the inband signaling packets that enable the voice coder to adapt to the frequencies, bit rate and sequence of synthesized tones that represent the digital bit stream.

26. A cellular telephone according to claim 25 wherein the preconditioning bits are a random sequence of "1" and "0" binary bits.

27. A cellular telephone according to claim 20 including a decoder (16) coupled to the voice coder for detecting and decoding synthesized tones received over the digital voice channel.

28. A cellular telephone according to claim 27 wherein the decoder includes:
a first inband filter for filtering signals outside of a synthesized tone frequency band;

a second out of band filter for filtering signals inside the synthesized tone frequency band; and

a comparator that compares the signals outside the synthesized tone frequency band with the signals inside the synthesized audio tone frequency band and identifies signals as synthesized tones when the compared value is greater than a selected value.

29. A cellular telephone according to claim 28 wherein the decoder includes:
an active state that correlates detected synthesized tones with a first transform representing a binary "1" value and a second transform representing a binary "0" value;

a clock recovery state that synchronizes the decoder to the synthesized tones by first shifting samples of the synthesized tones until a maximum power ratio is detected in a digital synchronization pattern in the simulated voice data; and
a demodulation state where synthesized audio tones are demodulated back into digital data.

30. A cellular telephone according to claim 20 wherein the synthesized tones are generated at a first audible frequency to represent binary "1" values and at a second audible frequency to represent binary "0" values, the first and second frequencies being about 100 Hertz apart, each extending for a duration of about 10 milliseconds and generated as one continuous signal.

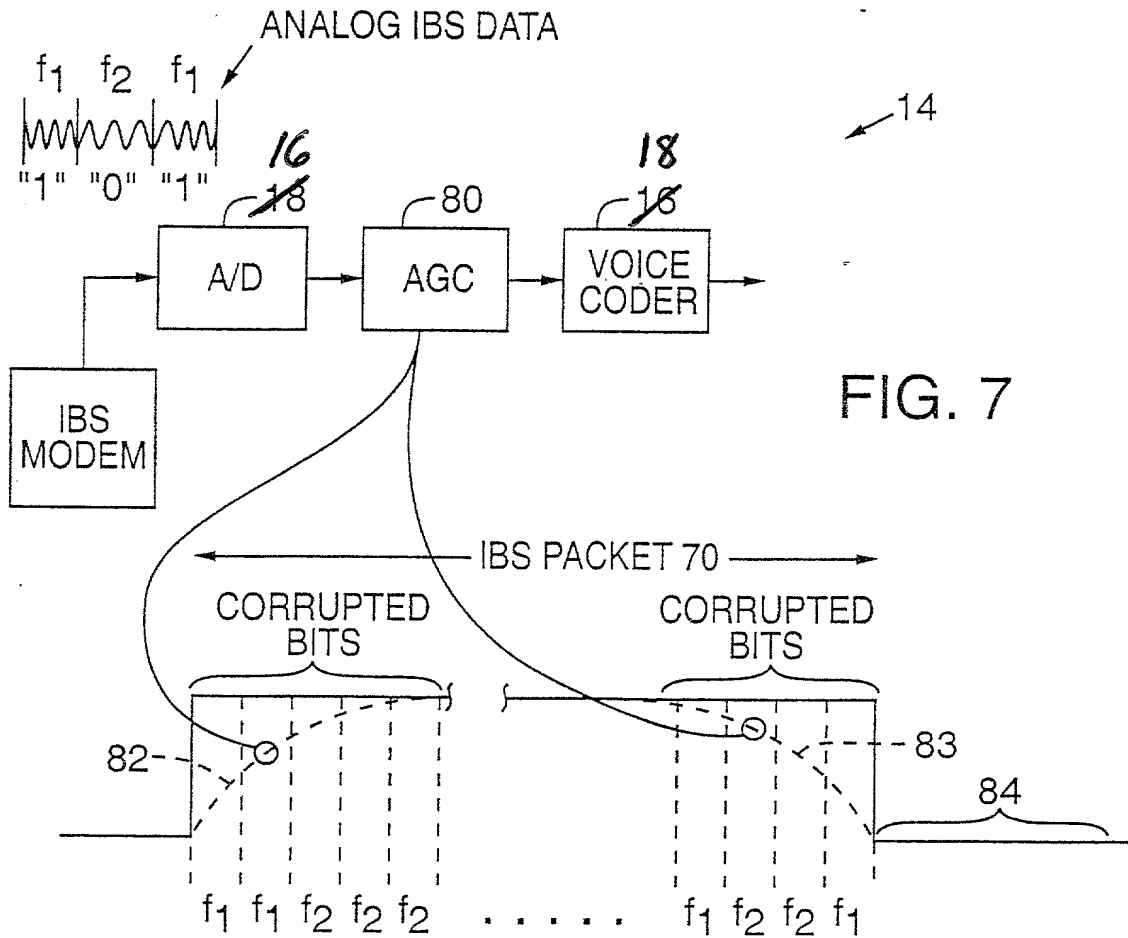


FIG. 7

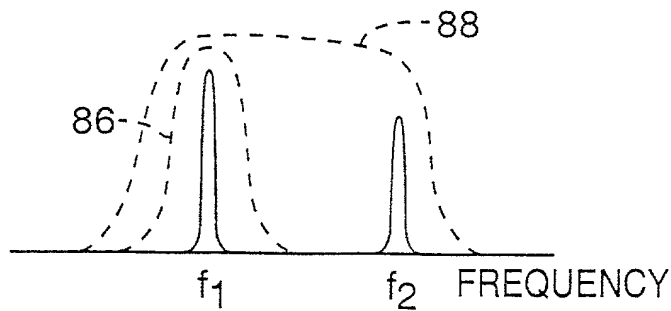


FIG. 8

